

REMARKS

Claims 1-3, 5-9 are remain in the case.

Claims 6 and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The specification has been amended to properly provide enablement in the specification by amending paragraph [0011] of the specification to include only the existing subject matter that was recited in the original filing of the application, namely that in claim 4 and claim 7.

The office action references the last sentence of paragraph [0014] to suggest the specification implies that the pump is being monitored to determined its output and that the pump is varying and not constant. The last sentence of paragraph [0014] reads of follows:

"The data for the estimated pressure may be obtained using measurements near the pump outlet and corrected as necessary for any pressure drop in the fuel line to the fuel rail."

The office action clearly misinterprets this sentence to allegedly suggest the fuel pump output is varying. The preceding sentence in paragraph [0014] clearly identifies the rationale for retrieving the measurement data at this location. The preceding sentence in paragraph [0014] reads as follows:

"The fuel line may include fuel filters and connections that result in a pressure drop between the fuel pump and fuel rail."

As stated, measurement data is taken at this location to account for pressure variations as a result of other subcomponents, namely filters and connections, within the fuel lines between the fuel pump and injectors which account for the pressure variations.

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The amended specification has been amended to include the substantially constant output of the fuel pump which was recited in the original filing of the application, namely that in claim 4 and claim 7. The claims are now in condition for examination and the objection should be withdrawn.

The rejection of claims 1-2, 5-7, and 9 under 35 U.S.C. 103(a) as being unpatentable over U.S. Morikawa in view of Minagawa is respectfully traversed.

Claim 1 and claim 6 recite a method for operating an automotive engine including fuel injectors that open to deliver fuel to the engine. A mechanical returnless fuel system is provided for supplying fuel to the fuel injectors and also includes a fuel pump having a pump output. The pump output is substantially constant. The controller regulates an opening time for the fuel injectors to deliver the precise quantity of fuel. A portion of the pump output is returned to the fuel pump supply.

The office action allegedly suggests that Morikawa teaches the basic structure of applicants system and Minagawa teaches the use of an electrically driven pump and non-return rail; however neither system describes a fuel pump having a substantial constant output. Minagawa describes a system where the current to the pump is increased to increase the pump output for controlling the fuel pressure provided to the fuel injectors. Morikawa does not suggest a fuel pump having a constant output.

In contrast, claim 1 recites the fuel pump having a constant output. That is, the fuel pump provides a substantially constant output based on a substantially constant voltage provided to the pump (with the exception of variations in the power supply system) while the pressure and flow rates in the fuel lines to the fuel injectors are regulated by the pressure regulating valve coupled to the return line. By regulating the pressure and flow rates in the return line via the pressure regulator valve, the entire fuel system fuel flow and pressure is regulated without having to change the output of the fuel pump. As a

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result, increases and decreases of the pressure and the fuel flow rate within the fuel system are controlled by closing/opening of the pressure regulating valve without having to change the output of the fuel pump. For example, if the pressure regulating valve is closed, pressure in the fuel lines increase while flow rates decrease. Alternatively, by opening the pressure regulating valve, fuel is allowed to return to the supply, as a result, flow rates in fuel lines increase while pressure in the fuel line decreases. Such changes occur while supplying a substantially constant output by the fuel pump.

For the reasons set forth above, Morikawa and Minagawa fail to describe or suggest the mechanical returnless fuel system utilizing a fuel pump having a substantially constant output as recited in claims 1 and 16. Therefore, claim 1 and 16 are allowable.

The rejection of claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa and Minagawa, and in further view of Gaskins.

Claim 3 depends from claim 1 and claim 8 depends from claim 6. Therefore claims 3 and 8 are allowable.

In view of the foregoing amendment and remarks, all pending claims are in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,



Frank L. Lollo
Reg. No. 48,854

MacMillan, Sobanski & Todd, LLC
One Maritime Plaza, Fourth Floor
720 Water Street
Toledo, Ohio 43604
Tel: 734-542-0900
Fax: 734-542-9569

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